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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/556,663	11/11/2005	Morito Akiyama	HARAP0166US	8510

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EXAMINER
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ROSENAU, DEREK JOHN

ART UNIT	PAPER NUMBER
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2837

MAIL DATE	DELIVERY MODE
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06/17/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/556,663	<b>Applicant(s)</b> AKIYAMA ET AL.	
	<b>Examiner</b> Derek J. Rosenau	<b>Art Unit</b> 2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 105563 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 and 26-29 is/are pending in the application.
- 4a) Of the above claim(s) 1-12 and 26-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 13-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamada et al. (US 2002/0190814).

3. With respect to claim 13, Yamada et al. discloses a laminate (Fig 2), which is applied as an electronic component material having a piezoelectric property (Paragraph 34), comprising: a substrate (item 45); a first wurtzite layer (item 42), made of a wurtzite crystalline structure compound (Paragraph 45, both AlN and ZnO are wurtzite structure compounds), which has a thickness of 50 nm to 200 nm (Paragraph 141) and which is formed directly on the substrate so as to be in contact with an entire surface of the substrate (Fig 2); a functional material layer (item 44) which covers an entire surface of the first wurtzite crystalline layer (Fig 2) and which is made of an elementary substance of molybdenum or tungsten or of a compound containing at least one of molybdenum and tungsten (Paragraph 48) so as to have a thickness of 100 nm to 300 nm (Paragraph 142); and a second wurtzite crystalline layer (item 41) which covers the functional material layer (Fig 2) and is made of the wurtzite crystalline structure compound (Paragraph 45, both AlN and ZnO are wurtzite structure compounds), and the first wurtzite crystalline layer, the functional material layer and the second wurtzite

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layer being stacked on or above the substrate (Fig 2) in this order so as to have a four layer structure (Fig 2).

4. With respect to claim 14, Yamada et al. discloses the laminate as set forth in claim 13, wherein the substrate is made of any one of a monocrystalline material, a polycrystal material, and an amorphous material (Paragraph 45, Mo and W are both polycrystalline materials).

5. With respect to claim 15, Yamada et al. discloses the laminate as set forth in claim 13, wherein, as best the examiner can ascertain, a c-axis perpendicular to a (0001) surface of the wurtzite crystalline structure compound constituting the first wurtzite crystalline layer and a c axis perpendicular to a (0001) surface of the wurtzite crystalline structure compound constituting the second wurtzite crystalline layer orient substantially perpendicular to a surface of the substrate (Paragraph 178).

6. With respect to claim 16, Yamada et al. discloses the laminate as set forth in claim 13, wherein the first wurtzite crystalline layer and the second wurtzite crystalline layer contain as a main constituent one compound or more selected from the group consisting of aluminum nitride, gallium nitride, indium nitride, and zinc oxide (Paragraph 45).

7. With respect to claim 17, Yamada et al. discloses the laminate as set forth in claim 13, wherein the first wurtzite crystalline layer and the second wurtzite crystalline layer contain aluminum nitride as the main constituent (Paragraph 45).

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8. With respect to claim 18, Yamada et al. discloses the laminate as set forth in claim 13, wherein the first wurtzite crystalline layer and the second wurtzite crystalline layer are made of a same constituent (Paragraph 45).

9. With respect to claim 19, Yamada et al. discloses the laminate as set forth in claim 13, wherein the functional material layer contains any one of a monocrystalline material, a polycrystalline material, and an amorphous material (Paragraph 45, Au, Pt, W, and Mo are all polycrystalline materials).

10. With respect to claim 20, Yamada et al. discloses the laminate as set forth in claim 13, wherein the functional material layer contains a conductive material (Paragraph 45, Al, Pt, W, and Mo are all conductive materials).

11. With respect to claim 21, Yamada et al. discloses the laminate as set forth in claim 13, wherein the functional material layer contains a metal (Paragraph 45, both Au, Pt, W, and Mo are all metals).

12. With respect to claim 22, Yamada et al. discloses the laminate as set forth in claim 13, wherein the functional material layer contains a metal having a body-centered cubic structure or a hexagonal close-packed lattice structure (Paragraph 45, Mo and W are both body-centered cubic structures).

### ***Response to Arguments***

13. Applicant's arguments, see amendments/arguments, filed 21 April 2009, with respect to claims 13-22 have been fully considered and are persuasive. The 35 U.S.C. 103 rejections of claims 13-22 have been withdrawn.

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14. Applicant's arguments filed 21 April 2009 have been fully considered but they are not persuasive. Applicant argues that Yamada et al. does not disclose a four layer structure in which the substrate, the first wurtzite crystalline layer, the functional layer, and the second wurtzite layer are stacked in this order. However, if the lower electrode in figure 2 is interpreted as a substrate, then the device of Yamada et al. discloses a four layer structure in which the substrate, the first wurtzite crystalline layer, the functional layer, and the second wurtzite layer are stacked in this order with the device of Yamada et al. additionally having the top electrode placed on top of the four layer structure.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek J. Rosenau whose telephone number is (571) 272-8932. The examiner can normally be reached on Monday thru Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Benson can be reached on (571) 272-2227. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Derek J Rosenau/

Examiner, Art Unit 2837

/Walter Benson/

Supervisory Patent Examiner, Art Unit 2837